## Policy factsheet 42: Regulation of the use of residual biomass from olive oil industries (D 4/2011)

* + 1. **Title policy instrument**

Regulation on use of olive mill waste waters (effluents) from olive oil industry as fertilisers on agricultural soils (*DECRETO 4/2011, de 11 de enero, por el que se regula el régimen del uso de efluentes de extracción de almazara como fertilizante agrícola*).

*Link to full text of legal source (original language):*

[https://www.juntadeAndalusia.es/boja/2011/14/d1.pdf](https://www.juntadeandalucia.es/boja/2011/14/d1.pdf)

* + 1. **Main aim of the policy instrument (short)**

The objective of this decree is to establish the legal status for the use of the olive mill waste waters(*efluente de almazara*) produced in the virgin olive oil extraction mills as agricultural fertilizer.

* + 1. **Country where it is implemented**

Spain, Andalusia

* + 1. **Year of first implementation**

2011

* + 1. **Is the policy still implemented? If not specify final year of implementation.**

Yes

* + 1. **Type of instrument\***

Regulation (imposed by law)

* + 1. **Biomass value chain position targeted\*\***

Biomass

End use

* + 1. **Description of the instrument (long)**

(*What is the instrument meant to bring about, how does the instrument work, who are targeted by the instrument*)

The purpose is to regulate the use of waste water/effects of olive oil extraction activity and return it to the olive fields as fertilizer in the agricultural soils, restoring some of the nutrient extractions caused by the crop. According to Ouzounidou et al. (2010) olive mill wastewater possesses considerable amounts of mineral nutrients such as potassium (K2O: 2.4-10.8 g/l) and phosphorus (P2O5: 0.3-1.5 g/l), and a wide-range of micronutrients. On the other hand, olive oil effluents applied on land may also have adverse environmental effects such as soil contamination, underground seepage, water-bodies pollution and foul odor emissions (Ouzounidou et al. (2010), IPPC BREF, 2006). Regulation of the use of these residues as fertilisers is therefore necessary.

In general terms there is a SWOT analysis done by Galanakis (2017) on the direct application of olive mill waste waters on soils (see Figure 1).

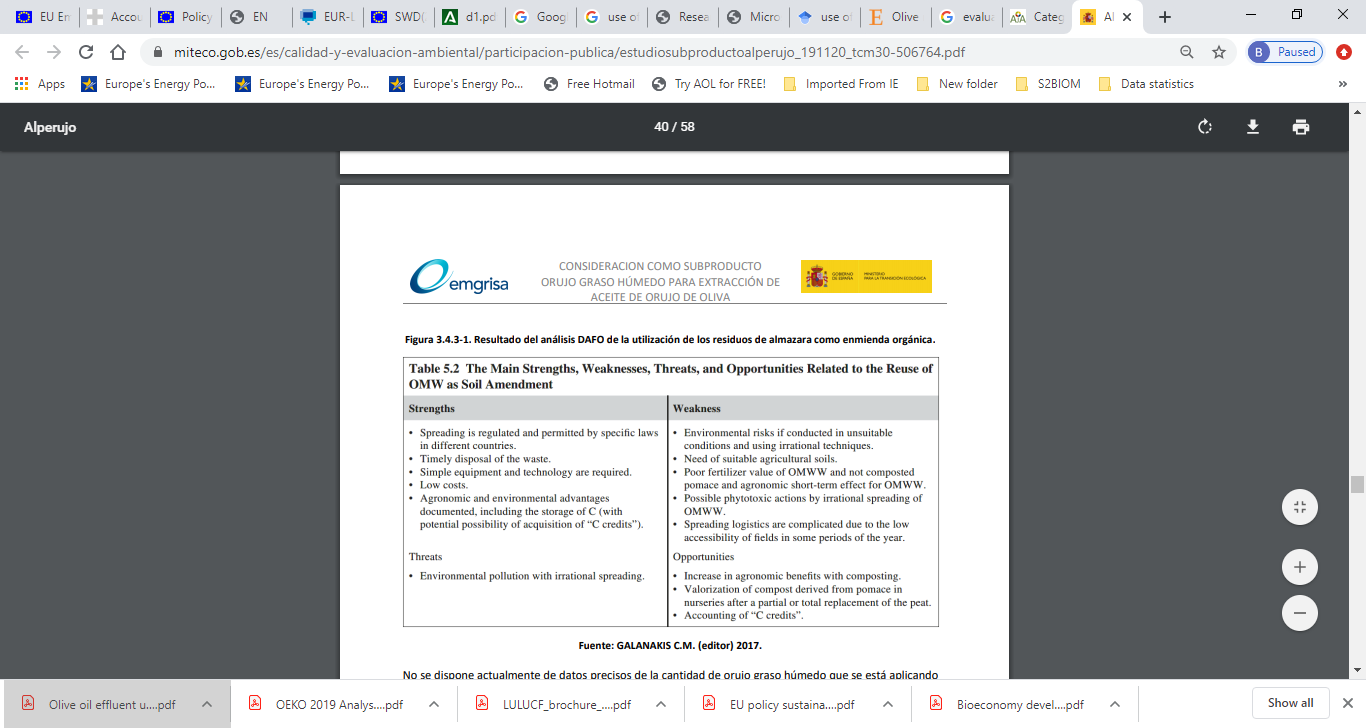


Figure 1: SWOT analysis of direct application of olive mill waste waters on soils.

Effluents are produced in two phases of the olive oil extraction process. In the first phase before the oil extraction, the whole olives are washed with water and this water ends up as effluent. After the oil extraction in the second phase, the resulting oil needs to be washed again with water. Again, effluents consisting of this washing water result.

The use of these effluents in agricultural soils has many advantages. They replace the input from nutrient and water resources outside the system, which have costs, cause additional energy consumption and GHG emissions and are largely fossil-based. Avoiding external inputs through the use of effluents from the olive mills in the olive production systems has therefore many environmental and economic advantages. Furthermore, in most olive oil mills a modernisation of the process took place in recent years that led to a reduction of the pollutants occurring in the effluents from the washing of the olives and the olive oil. The risk of accumulation of hazardous substances in the effluents has therefore declined. Using the effluents as fertilisers in olive production requires a legal basis that organises the amount used, the location where it is used and the compositional characteristics of the effluent allowed to be applied on soil. These aspects need to be made consistent with the prescriptions in other laws. Such as the Laws that regulate water quality (*Ley de Aguas Real Decreto Legislativo 1/2001 & Ley de Aguas de Andalucía (Ley 9/2010)*) and the law that regulates the integrated management of environmental quality in agriculture (*Gestión Integrada de la Calidad Ambiental, artículo 84 de la Ley 7/2007*). These laws prescribe that the use of effluents in agricultural soils can only be allowed if this does not create any risk for water, air or soil quality and for flora and fauna. Also the updated law regulating water quality (*Ley de Aguas Real Decreto Legislativo artículo 5 de la Directiva 2008/98/CE*) already gives specifications on the use of effluents from industry as fertilisers. It regulates precisely on what type of land and soils the types of effluents can be used, the land application mechanisms, the commitments of the mills, consent of the holders of the receiving parcels and the managers of the irrigation systems through which the effluent is applied and the required analytical controls to be made. Despite this, this new law on use of effluents from olive oil mills as fertilisers is essential as it regulates some additional issues specifically for olive mill effluents. These additional issues are:

1. The confirmation that olive oil effluents are produced as an integral part of the virgin olive oil production process and therefore comply with the EU waste law 2008/98/EC declaring that these residues are indeed considered by-products and not wastes.
2. The requirement for asking permission for the use of effluents as fertilisers in agriculture. This can be asked by owners of olive oil mills or of purchase centers of effluents or, holders of the tanks containing the olive oil mill effluents, which are intended to used fertilizer in agriculture. The entity wanting to use the effluent as fertiliser must get the permission from the Regional Ministry of Agriculture of the Junta de Andalucía. The request for authorization needs to be accompanied by an ‘Effluent Management Plan’.
3. The effluent management plan will need to be approved by the Ministry responsible for agriculture in every Andalusian province which has 6 months for this decision.
4. The ‘Effluent Management Plan’ should specify:
   1. Technical and analytical characteristics of the effluents
   2. Characteristics of the soils it is to be applied on
   3. Method and period of application of the effluent to the soil
   4. The plan must be signed by a competent person working in the company that applies for the permission
5. When the effluent is applied to soil the following requirements need to be complied with:
   1. A written consent of the land-holder it is applied to
   2. A written consent of the managers of the irrigation systems through which the effluent is applied
   3. After application of effluent to soil, indicate the identification of the *piece of land* (each parcela or piece of land, ie the area of the land has a identification number which must be indicated in the form sheet document as well as the volume of effluent applied.
   4. At the end of the annual effluent application period (before November 30 of each year) the person responsible for the Effluent Management Plan must submit an annual report specifying the volumes and the fertilized surfaces applied. The annual report needs to be approved by the competent authority at provincial level.
   5. Document to be submitted after each application and then annually with the total effluent data.
6. The application of effluent as fertiliser needs to comply with the following specific rules:
   1. The amount applied cannot exceed more than 50 M3 per hectare per year
   2. Applications must be made in such a way that it does not produce surface runoff, leaching, or lead to groundwater table increases
   3. Effluents, when NOT applied through ferti-irrigation with drip application, cannot be spread within 500 m of urban areas, within 100 m of drink water protection areas (as defined in the Regulation for Public Water, approved by Royal Decree 849/1986) and within 100 m of a terrestrial maritime public area (as defined in the Law on Coasts 22/1988)
7. How control on following the requirements of this law is done and what consequences are to be applied in case of breaches.
   * 1. **Is this instrument following up on EU policy? Either transposed policy to national/regional level or a policy to reach EU policy targets/ambitions? If yes, which policy and which EU targets and ambitions?**

Yes, it follows on the EU Waste Directive 2008/98 / EC. This directive establishes in article 5, paragraph 1, the conditions that must be met for a substance resulting from a production process that can be considered as a by-product and therefore not as a waste. This directive prescribes that effluents from industries can be used as fertilisers if:

1. They are produced as an integral part of the olive oil production process,
2. without any further transformation other than normal industrial practice and
3. the substance must meet all the relevant requirements that ensure that it will not cause any adverse effects on the environment or on human health.

The Andalusian Law is therefore a further specification of complementary requirements applying specifically to olive oil mill effluents. After all, the EU Waste Directive applies to effluents in general but there is no EU legislation regulating olive mill waste management, and standards are left to be set by individual countries.

* + 1. **Can you explain the impact of the policy in type, size, time and money spent? (*Should be based on evaluations)***

The number of submitted and approved Effluent Management Plans and the amount of applied olive mill effluent is regularly monitored by the Junta de Andalusia. Underneath the monitoring results of the 2016/2017 olive oil harvest campaign are presented[[1]](#footnote-1). The pie chart indicates the management plans that have been authorized in each of the provinces for both mills and purchasing centers that have requested such use of effluents and have had the necessary management plan approved for the reuse of such effluents.

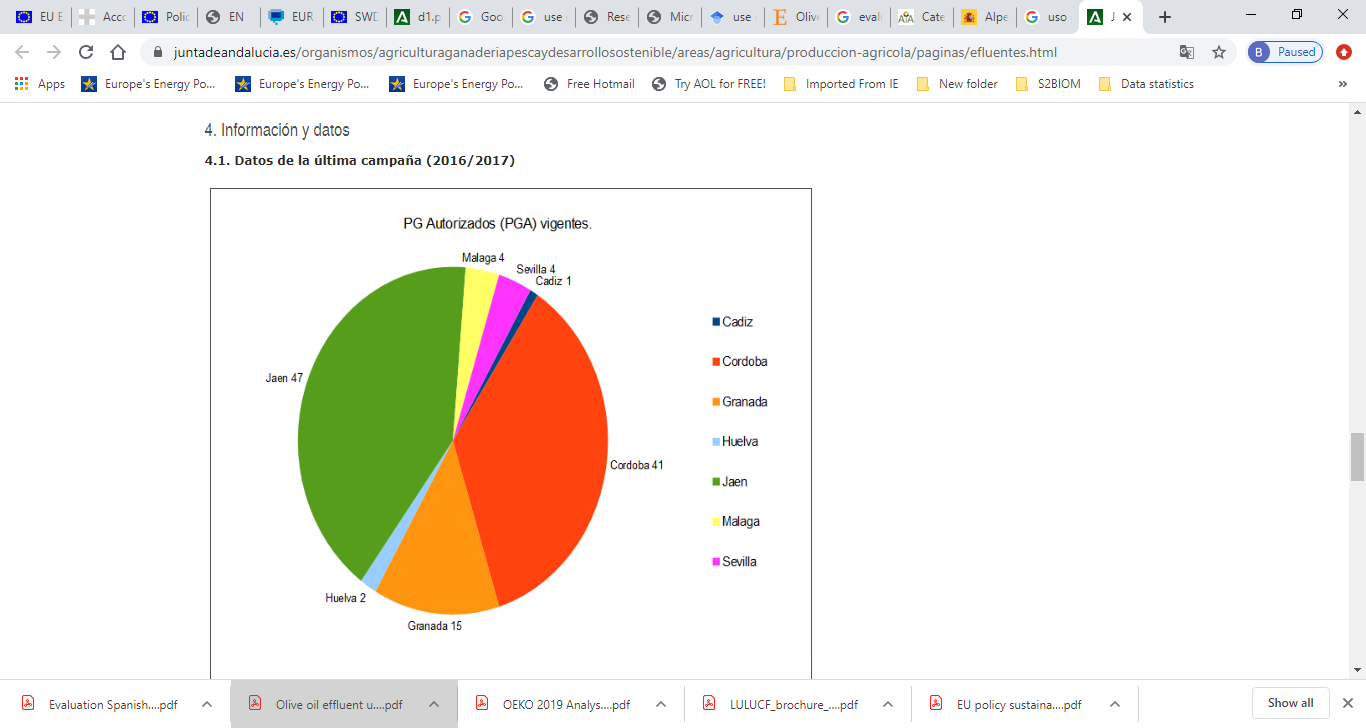


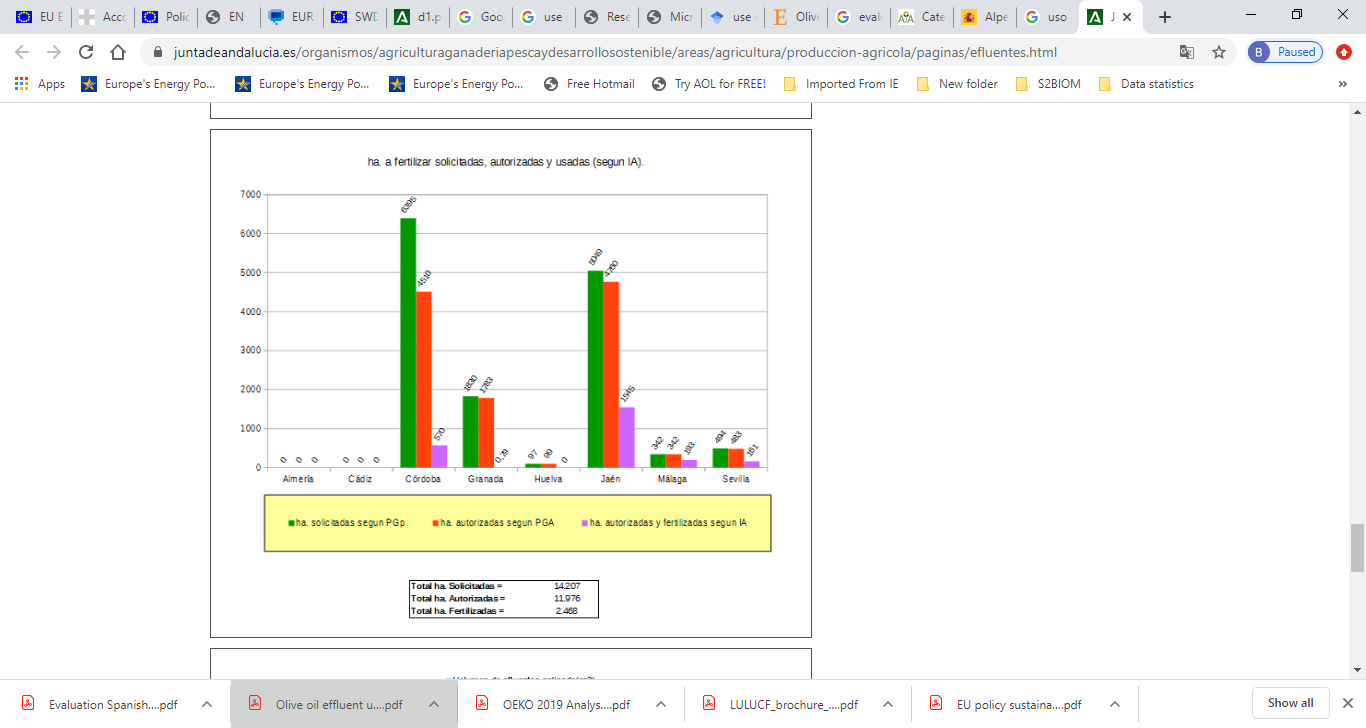
Figure 2: Number of approved Effluent Management Plans in 2016/2017 in Andalucía per province.

Figure 3: Number of hectares for which authorization was applied (green), for which authorization was granted (orange) and to which fertilisation with effluents was also applied (purple) in Andalucía 2016/2017.

At national level a study was done in 2019 on whether one of the effluents from the olive oil mills (‘*orujo graso húmedo’*) can be regarded as by-products instead of waste according to the EU Waste Directive 2008/98 /EC. It showed that 96% of the effluents produced in the mills are also reused in or outside the mills. It was also concluded that the volumes of this production residue have increased considerably in recent years. The report concludes that although the production is large and increasing the olive oil industry can manage the processing of the residue, including for fertilisation use. With respect to the protection of human health and the protection of the environment, it is concluded that no general adverse impacts are expected. Consequently, it was concluded that all four conditions defined in EU Waste Law 22/2011 are met and that the effluents from the olive oil mills in Spain can be declared by-products.

* + 1. **Why can this policy be seen as a good policy example?**

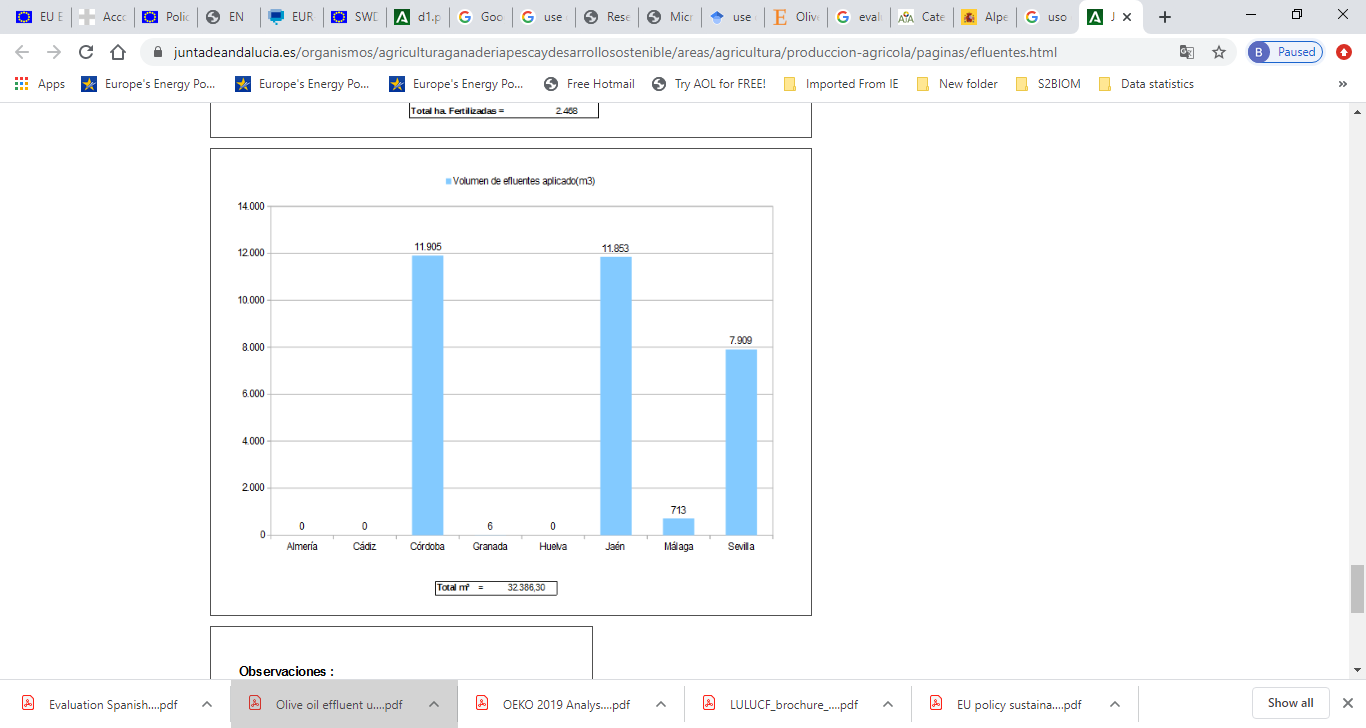
It is generally not common that the use of olive oil mills effluents are regulated in a way that they can be declared by-products according to the EU Waste Law. This legal arrangement supports the more circular use of these olive oil residues and supports both the environmental and economic sustainability of the olive oil sector. In countries and regions where this is not arranged, the options to create a more circular olive oil production system are more limited.

Figure 4: Amount of m3 of effluents applied to lands in 2016/2017 in Andalucía.

* + 1. **Would you recommend this policy instrument to be replicate in regions in low, medium, high BBE development stage? Explain why.**

Yes, in countries /regions that have important olive oil production. Regulation can ensure:

1. The exploitation of unused biomass
2. The sustainable and resource efficient exploitation
3. May prevent unsustainable dumping of the effluents
4. May help to make the olive oil sector more circular and bring down GHG emissions through exchanges part of the fossil-based fertilisers with olive oil mill effluents.
   * 1. **Are there similar policy instruments implemented in other EU countries/regions? If yes explain which ones.**

Within Spain, beside Andalucía, the autonomic regions of Cataluña (since 2015) and Valencia (since 2018) have regulated the use of effluents from the olive oil mills as fertilisers on land.

Olive oil waste regulations exist in Italy, Greece, Spain, Cyprus and Portugal. Specification of these regulations are, however. often different with respect to several rules (as was reviewed by Inglezakis et al., (2012).

* + 1. **Barriers and solutions encountered in the development and implementation of this policy instrument**

Difference in the way the policy is implemented in Spain and also between EU countries.

* + 1. **References used and more information available at:**

Inglezakis, V.J, Moreno J.L. & Doula M. (2012). Olive oil waste management EU legislation: Current situation and policy recommendations. www.journal-ijcees.com ISSN: 0976-3716 (print) IJCEES Vol 3(2):65-77, 2012.

IPPC BREF, 2006. Integrated Pollution Prevention and Control, Reference Document on Best Available Techniques in the, Food, Drink and Milk Industries, European Commission.

Ouzounidou, G., Zervakis, G.I. and Gaitis, F., 2010. Raw and Microbiologically Detoxified Olive Mill Waste and their Impact on Plant Growth, Terrestrial and Aquatic Environmental Toxicology. Global Science Books.

1. Source: <https://www.juntadeAndalusia.es/organismos/agriculturaganaderiapescaydesarrollosostenible/areas/agricultura/produccion-agricola/paginas/efluentes.html> [↑](#footnote-ref-1)